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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,675	12/17/2001	Isao Ota	111-483	5111
25944 7590 05/11/2009 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
ANGADI, MAKI A				
ART UNIT		PAPER NUMBER		
1792				
MAIL DATE		DELIVERY MODE		
05/11/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/015,675

Applicant(s)

OTA ET AL.

Examiner

MAKI A. ANGADI

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/22/2009 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C.103(a).

3. Claims 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatsu et al. (US 4,769,073) in view of Ashley et al. (EP 444470 A1) and further in view of Aozasa (US 6,171,572 B1) and Brancaleoni (US Patent No. 5,264,010)

As to claims 19 and 22, Tatsu teaches an admixture that contains a cerium oxide and lanthanide salt and that has a pH of greater than 6 but not less than 10 (column 7, line 19 - column 8, line 7). The aforementioned reads on and encompasses, a solution having a pH of 3 to 6 or 8 to 10, **in claims 19 and 22**.

Tatsu also teaches an admixture with a solution of a cerium salt, an aqueous solution of a salt of at least one trivalent rare earth, which includes lanthanum, praseodymium, and neodymium (column 4, lines 14-29) and lists a composition comprising: ceric oxide, lanthanum oxide, and neodymium oxide and having a mean particle diameter of $1.5 \pm 1 \mu\text{m}$, in EXAMPLE 1 (column 12, lines 13-37). Tatsu discloses ceric oxide in the form of the composition described in French Pat. No. 2,549,846 and such compositions comprise a crystallographic phase of CeO_2 type... and corresponding to the formula $\text{Ln}_{2-x}\text{Ce}_x\text{Si}_2\text{O}_{10}$ in which..., x is greater than or equal to 0 and less than 2" (column 5, lines 7-15). The aforementioned further reads on, a solution comprising particles dispersed in a medium, wherein; the particles comprise as a main component crystalline cerium oxide of the cubic system and as an additional component a lanthanum compound, neodymium compound or a combination thereof; and the additional component is contained in an X/ (Ce + X) molar ratio of 0.005 to 15

in which X is lanthanum atoms, neodymium atoms or a combination thereof.

The aforementioned also reads on, an abrasive comprising a sol including particles dispersed in an aqueous medium, wherein; the particles comprise as a main component crystalline cerium oxide of cubic system and as an additional component a lanthanum compound, neodymium compound or a combination thereof; the additional component is contained in an $X/(Ce + X)$ molar ratio of 0.005 to 0.15 in which X is lanthanum atoms, neodymium atoms or a combination thereof, **in claims 19 and 22**; wherein the additional component is a lanthanum compound, **in claims 20 and 23**; wherein the additional component is a neodymium compound, **in claims 21 and 24**; and Tatsu differs in failing to teach a particle size of 2 to 200 m^2/g , **in claims 19 and 22**.

Ashley discloses a stable ceria composition of one or more of La, Nd or Y and the stabilized ceria retains a surface area of greater than 20 m^2/g (Abstract), which encompasses a particle having a specific surface area of 2 to 200 m^2/g . Since Ashley illustrates the specific combination of particles having a surface area of 2 to 200 m^2/g is known, then it would have been obvious to one having ordinary skill in the art at the time the invention was made to select any range of surface area as taught by Ashley, including Applicants' specifically claimed range of surface area for the purpose of forming a high surface area ceria composition by incorporating one or more of La or Nd to the composition (Ashley, Abstract).

Tatsu in view of Ashley differs in failing to teach a solution wherein the particles have a particle size of 50 to 150 nm, **in claims 19 and 22**.

Aozasa teaches, "... a cerium solution having an average colloidal particle size of 3 to 100 nm, and optionally one or more members selected from the group consisting of salts of yttrium, scandium, lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, magnesium, calcium, barium, aluminum, titanium, and hafnium. • ." (column 3, lines 49) and "... a cerium solution having an average colloidal particle size of 3 to 100 nm, preferably 5 to 80 nm, more preferably 10 to 50 nmIf the average colloidal particle size is smaller than 3 nm, production in industrial scale will be difficult (column 5, lines 52-59). Aozasa also teaches, cerium sol having a concentration of about 100 to 200 g/liter (~10 to 20 g/100 ml or 10-20 wt %), (column 6, lines 4-6).

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify the combination of abrasive materials as taught by Tastu in view of Ashley, by using Aozasa's sol having a particle size of 3 to 100 nm which falls within the particle size range as claimed by applicants for the purpose of ease of production on an industrial scale (Aozasa, column 8, lines 42-45).

Tastu in view of Ashley and Aozasa differ in failing to teach an abrasive for polishing a substrate comprising silica in an amount of 50 wt% or more, an abrasive for polishing a rock crystal, a quartz glass for a photomask, a semiconductor device or a hard disk made of glass, *in claim 19*; and an abrasive for polishing an organic film with the Chemical Mechanical Polishing method, an Inter Layer Dielectric (ILD), or a shallow trench isolation of a semiconductor device, *in claim 22*.

Since the combination of Tastu in view of Ashley and Aozasa teaches Applicants' specifically claimed abrasive, then using the said combination in the same manner as

claimed by Applicants would result the same in an abrasive for polishing a rock crystal, a quartz glass for a photomask, a semiconductor device or a hard disk made of glass; an organic film with the Chemical Mechanical Polishing method, an Inter Layer Dielectric (ILD), or a shallow trench isolation of a semiconductor device; and an organic film with the Chemical Mechanical Polishing method, an Inter Layer Dielectric (ILD), or a shallow trench isolation of a semiconductor device.

As to claims 25 and 26, Tatsu is silent about a solution that includes a water soluble polymer, an anionic surfactant, a nonionic surfactant and a cationic surfactant. However, Brancaleoni discloses the use of a solution that includes surfactant compounds e.g. non-ionic, anionic, cationic or amphoteric surfactants (col.5, lines 16-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use surfactant in the composition because Brancaleoni illustrates that surfactant compounds may provide an anti-scratching effect on the surface of the work piece and thereby decrease the extent of surface defects caused by abrasive agents (col.5, lines 6-11).

Response to Arguments

4. Applicant's arguments filed on 4/22/2009 have been fully considered but they are not persuasive.

Applicants' arguments on page 4-5 of the reply with respect independent claims 19 and 22 asserting that the combined reference of Tatsu, Ashley and Aozasa do not meet limitation of a solution having pH of 3-6 or 8-10 are not convincing. Tatsu

describes a solution of the salt or salts of the rare earth or earths which is added continuously to the reaction medium in parallel with the basic solution (col.8, line 15-23) to achieve a pH that is greater than 6 but less than 10 (col.8, lines 3-7), therefore encompasses the range cited in independent claims 19 and 22. Tastu discloses that the polishing composition could be in the form of an aqueous suspension (col.5, lines 60-65, col.9, lines 21-23) or in the powder form (col.9, lines 28-30) and leads to a stable composition (col.10, lines 33-41) as illustrated in Examples 1-8 (cols.12-14) and with pH in the range of about 6-10 (col.3, lines 59-64, col.5, lines 60-65, claim 24). Ashley et al discloses the improvement of dispersion stability by uniform incorporation of the ceria stabilizer into the ceria precursor to form an intimate mixture (page 4, lines 3-8) as illustrated in Examples in 1-7.

Applicants' arguments on page 7 of the reply asserting that the solution disclosed by the reference of Tastu is merely a solution with cerium salt but not an intermediary solution of cerium oxide with pH greater than 6, but less than 10 are not convincing. Tastu discloses the process of introducing cerium into the reaction medium in the cerous state and is then oxidized to the ceric state and hence controlling the pH of the reaction medium (col.3, lines 31-64).

Applicants' arguments on page 8 of the reply asserting that the reference of Brancaleoni does not provide any motivation to combine the teachings of Tastu are again not convincing. According to Brancaleoni, use of surfactants is well-known in the CMP process of semiconductor planarization to improve efficiency and quality of polishing compositions (col.1, lines 13-43).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MAKI A. ANGADI whose telephone number is (571)272-8213. The examiner can normally be reached on 8 AM to 4.30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Maki A Angadi/
Examiner, Art Unit 1792

/Nadine G Norton/
Supervisory Patent Examiner, Art Unit 1792